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Hospital-acquired pneumonia surveillance – an unmet need

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Comment

Hospital-acquired pneumonia (HAP) is the neglected relation in the family of healthcare-associated infections (HAIs). HAP is now the commonest HAI in Europe ,[1] and nearly two-thirds are not associated with intubation.[2] Despite this, outside the intensive care unit (ICU), HAP struggles for recognition and research funding. The limited evidence available suggests that HAP complicates approximately 1·5% (95% CI 1·4-1·6) of UK hospital admissions ,[2] has a major impact on length of stay ,[3] and because its management invariably involves broad-spectrum antibiotics, has potential to be an important driver for the emergence of antibiotic resistance .[4] HAP is associated with higher mortality (29% with HAP versus 8% without),[5] but the attributable mortality is unknown.

Obtaining accurate estimates of prevalence across multiple healthcare environments via prospective surveillance is a fundamental first step toward preventing HAP. Currently the only surveillance undertaken across Europe and even the US is via one-day point prevalence surveys.[1,2,6] In the UK, the 2012 survey recommended the development of learning tools for the prevention of healthcare-associated pneumonia .[2] However, these recommendations have not been actioned. This stop-start approach fails to keep HAP on the agendas of clinicians, microbiologists, healthcare managers or policymakers, and lacks the detail needed to better understand HAP epidemiology. Continuous collection of surveillance data has played a key role in reducing MRSA bacteraemia and *C. difficile* infection, simultaneously highlighting the scale of the problem, and providing real-time feedback on the efficacy of interventions. There is now limited but credible evidence that interventions such as enhanced oral hygiene can contribute to significant reductions in HAP outwith the ICU ,[7] and these

interventions warrant large scale randomised controlled trials. Given an average of 12 extra bed-days per patient ,[3] the potential benefits of reducing HAP by even 10% on an international scale are huge, in terms of reduced length of stay, improved patient flow, antibiotic stewardship, cost savings, and improved functional outcomes for patients.

One of the major obstacles in initiating surveillance for HAP is the lack of gold standard diagnostic criteria in non-ventilated patients. Unlike MRSA or *C. difficile*, a surveillance approach based on microbiological diagnosis is unlikely to be effective because high quality microbiological samples from alveolar regions of the lung are difficult to obtain. Patients at highest risk of HAP tend to be older and frail. Bronchoscopy is rarely performed in such patients, and sputum samples, the next best non-invasive alternative, may not be feasible (e.g. weak cough). However without criterion-based diagnosis which includes microbiological evidence, over-diagnosis is common,[5,8] and in the UK there is little financial incentive for accurate coding at discharge, making HAP difficult to detect using electronic records alone.

Although surveillance might over-diagnose HAP, it is crucial, both to highlight and to address the problem. Strategies for surveillance might feasibly incorporate pharmacy records of antibiotic prescriptions for respiratory infection, potentially combined with electronic patient records. Mandating clinicians to report HAP is another option, and might nudge clinicians toward criterion-based diagnosis of HAP. This approach might be assisted by pharmacy or infection prevention and control teams but would require significant investment in education and resources to support reporting mechanisms. Hybrid methods for surveillance, incorporating a variety of techniques may need to be used. Precedents do exist; the recent focus on surveillance of catheter-associated

urinary tract infection shows parallels in terms of diagnostic complexity, and a mix of clinical and microbiological surveillance has been employed to identify cases .[6,9] While it is difficult to attribute causation, in the US, a decrease in infections occurred in parallel with an increase in surveillance .[10]

Arriving at an improved, evidence-based yet pragmatic and accepted "standard" for continuous HAP surveillance will require coordination, effort and goodwill across a range of disciplines and professional societies. A specific focus on methods to improve diagnostic accuracy in HAP from funding bodies would accelerate this process. The community interested in HAP may also reflect on recent experiences in ventilator-associated pneumonia (VAP). VAP has been widely used as a quality indicator in healthcare systems, with high rates linked to financial penalties. This has arguably led to a bewildering array of new terms designed as quality indicators rather than clinical diagnoses. The opportunity to raise the profile of HAP surveillance should be founded on diagnostic accuracy, prevention and improved treatment, avoiding subtle political pressures that might inadvertently reduce diagnostic quality.

Well-established surveillance will allow interventions to reduce HAP to be tested and implemented more effectively. While there are certainly obstacles to overcome, the gains are likely to far outweigh the initial outlay.

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